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FETO IN MODERATE CDH: DOES AN EARLIER GESTATIONAL AGE AT SURGERY AFFECT OUTCOMES?**Francesca Maria Russo**

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Objective We evaluated whether performing FETO at an earlier GA leads to an improvement in neonatal outcomes in moderate left-CDH.

Methods Retrospective analysis of fetuses with left-CDH and moderate hypoplasia who underwent FETO before 30 weeks GA ("early FETO") across four centers. Outcomes were compared with those of the FETO-arm ("late FETO", 30-32 weeks) and the expectant-arm of the TOTAL trial.

Results Sixty-two early FETO cases were included. Baseline characteristics were similar across groups, except for higher maternal BMI and lower o/eLHR in the early FETO cohort. Early FETO resulted in a longer occlusion duration (36vs24 days, $p<0.05$). GA at balloon removal and rates of emergency removal were comparable. Survival to discharge was higher in the early FETO group compared with expectant management (74%vs50%, $p<0.05$), whereas late FETO did not show a significant survival advantage (63%). The need for ECMO was also reduced in the early FETO cohort. Early FETO was associated with increased risk of PPROM. Among survivors, morbidity did not differ between groups.

Conclusions Performing FETO at an earlier GA in moderate left-CDH appears to confer a survival advantage. Although earlier intervention increases the risk of PPROM, it does not appear to worsen prematurity-related neonatal morbidity.

[10-102]**Congenital diaphragmatic hernia: propensity score weighted outcome analysis of fetoscopic endoluminal tracheal occlusion versus standard management from the Congenital Diaphragmatic Hernia Study Group.**

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Objective

To report the outcomes of FETO in a multicenter CDH cohort and compare neonatal mortality and morbidity between patients who underwent FETO and those managed expectantly.

Methods

A retrospective cohort study selected FETO-eligible patients from the CDH Study Group registry (2015-2024). The primary outcome was in-hospital mortality, with secondary outcomes including ECLS use and gestational age at birth (preterm <37 weeks). Inverse propensity score weighting adjusted for covariates: o/e LHR (pre-FETO or ≤28 weeks), liver position, defect side, race, sex, and center survival rate.

Results:

Of 1293 FETO-eligible patients, 107 (8.3%) underwent FETO. After propensity score weighting, baseline characteristics were similar, and survival was higher in the FETO group than in expectant management (65.4% vs. 51.1%; OR, 1.81; 95% CI, 1.10 to 2.99; P=0.02). Fewer FETO patients received ECLS than expectant patients (38.7% vs. 46.6%; OR 0.87, 95% CI 0.48 to 1.08; P=0.12). Significantly more FETO patients were born before 37 weeks (65.0% vs. 29.0%, OR 4.38, 95% CI 2.90 to 6.71; P<0.01).

Conclusions

In this inverse propensity score-weighted analysis, FETO demonstrates a benefit over expectant care for survival to discharge; however, it increases the risk of preterm birth, consistent with earlier studies.

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Exploring Comparability in Retrospective FETO Cohorts: A Nationwide Multicenter Study

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Objectives:

To evaluate comparability between expectant management and fetoscopic endoluminal tracheal occlusion (FETO) in Japanese isolated left-sided congenital diaphragmatic hernia (CDH).

Methods:

This retrospective multicenter study used Japanese CDH Study Group registry (2006–2023) and national FETO center data (2014–2023). Eligibility criteria mirrored the TOTAL trials. The primary outcome was survival to discharge. Contemporary cases (2014–2023) formed the analysis cohort, undergoing restriction analyses within liver-up (LU) and liver-up plus Kitano grade 3 stomach position (LUG3) cohorts, logistic regression adjusting for observed-to-expected lung-to-head ratio (o/e LHR), and 1:1 o/e LHR matching. Sensitivity analyses compared 2006–2013 expectant management with 2014–2023 FETO.

Results:

Among 112 contemporary cases (88 expectant, 24 FETO), FETO cases showed lower o/e LHR with universal liver-up and Kitano G3. Survival to discharge was 71% (62/88) in expectant management and 38% (9/24) following FETO. The standardized mean difference for o/e LHR was -1.07 . Restriction reduced but did not eliminate imbalance (LU -1.06 ; LUG3 -0.64). Matching improved balance within LU (-0.09) but not LUG3 (-0.67). Regression and matched analyses demonstrated unstable treatment effect estimates. Non-contemporary analyses worsened imbalance.

Conclusions:

Substantial baseline imbalance between expectant management and FETO persisted despite restriction, adjustment, and matching, limiting treatment effect estimation.

[10-104]**Five-year follow-up after fetoscopic endoluminal tracheal occlusion for severe-to-moderate left-sided congenital diaphragmatic hernia: a multicenter retrospective cohort study****Alexandra BENACHI**

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Fetoscopic endoluminal tracheal occlusion (FETO) was developed to stimulate lung growth and pulmonary vascular development in severe congenital diaphragmatic hernia (CDH). Although FETO improves 6-month survival in the most severe cases, long-term outcomes remain poorly defined.

This multicenter retrospective cohort study evaluated 5-year outcomes in children with prenatally diagnosed severe-to-moderate left-sided CDH managed either with or without FETO. Children with isolated left-sided CDH and significant pulmonary hypoplasia were included. Outcomes assessed at 3–6 months, 1 year, and 5 years included pulmonary, gastrointestinal, and neurodevelopmental morbidity. Multivariable logistic regression adjusted for gestational age at delivery and prenatal severity markers.

Among 78 children with 5-year follow-up, 21 underwent FETO and 57 received expectant management. The FETO group had more severe prenatal disease, including greater pulmonary hypoplasia, intrathoracic liver herniation, and earlier delivery. At 5 years, unadjusted analyses showed higher rates of respiratory infections, inhaled respiratory treatments, acid-suppressive medication use, and executive or attention difficulties in the FETO group. However, after adjustment for disease severity and gestational age, FETO was not independently associated with increased pulmonary, gastrointestinal, or neurodevelopmental morbidity.

These findings support the long-term safety of FETO and provide important information for prenatal counseling and follow-up.

[10-105]

The smart TO balloon: report on the first 100 cases

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We aim to report the on the technical complication, deflation rate and neonatal outcomes of the first 100 patients who received FETO with the smart balloon at two fetal therapy centers (Leuven and Paris Beclère)

The study is completed. However, due to embargo from the journal accepting the paper, data cannot be shared at this stage.

[10-106]

Randomized trial of physiological-based cord clamping versus immediate cord clamping in infants with a congenital diaphragmatic hernia (PinC)**P.(Philip) L.J. DeKoninck on behalf of PinC study consortium.**

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Background: Pulmonary hypertension is a leading cause of mortality in infants with congenital diaphragmatic hernia (CDH). Experimental studies suggest that physiological-based cord clamping (PBCC) facilitates a more stable fetal-to-neonatal transition, thereby reducing pulmonary vascular stress. However, its clinical benefit in CDH remains to be established.

Methods: We conducted an international, multicenter, randomized controlled trial in infants with isolated left-sided CDH, born ≥ 35.0 weeks of gestation. Infants were randomized 1:1 to PBCC or immediate cord clamping (ICC), stratified by center and estimated severity of pulmonary hypoplasia. Postnatal management followed a consensus-based protocol. The primary outcome was presence of pulmonary hypertension within the first 24 hours, based on clinical and echocardiographic outcome measures.

Results: In a modified intention-to-treat analysis ($n=141$), pulmonary hypertension occurred in 67% (46/69) of infants in the PBCC group and 76% (54/71) in the ICC group ($p=0.30$; relative risk [RR] 0.88, 95% CI 0.71-1.08). Mortality before discharge from tertiary care hospital was 9% with PBCC and 13% with ICC (RR 0.68, 95% CI 0.25-1.80). Extracorporeal membrane oxygenation was required in 20% and 24% of infants, respectively (RR 0.85, 95% CI 0.45-1.58). No statistically significant differences were found in duration of supplemental oxygen, mechanical ventilation, or tertiary care admission. Maternal postpartum hemorrhage rates were not different between groups.

Conclusions: PBCC did not statistically significantly reduce pulmonary hypertension or secondary outcomes. Nonetheless, most effect estimates favored PBCC, suggesting a possible biological benefit not detectable with the current sample size. These findings support the feasibility and safety of PBCC in CDH.

Trial registration: Clinicaltrials.gov NCT04373902 (registered April 2020).

[10-107]**Minimally Invasive Surgical Treatment of Congenital Diaphragmatic Hernia Complicated by Neonatal Persistent Pulmonary Hypertension****Lishuang Ma**

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Objective: To evaluate a combined strategy of minimally invasive surgery, ex utero intrapartum treatment (EXIT), and extracorporeal membrane oxygenation (ECMO) for neonates with congenital diaphragmatic hernia (CDH) complicated by persistent pulmonary hypertension. **Methods:** Data from 126 neonates treated at a single center (2018.01–2026.05) were retrospectively analyzed. All underwent prenatal diagnosis. EXIT was performed as needed. Priority was given to thoracoscopic/laparoscopic repair with standardized perioperative management. ECMO was added in extremely critical cases. **Results:** The surgical rate was 91.2% (115/126); 77.3% (89/115) underwent minimally invasive repair, including 14 thoracoscopic patch repairs. EXIT was performed in 50.8% of cases (mean duration 2 min, no maternal complications). Of three extremely critical neonates receiving sequential prenatal diagnosis–EXIT–minimally invasive surgery–ECMO, two survived and one died due to delayed ECMO initiation. Overall survival was 80.9%, postoperative survival 88.7%, minimally invasive surgery survival 96.6%, and recurrence 5.26%. Surgery at 24–48 hours postbirth yielded the best prognosis. **Conclusions:** A prenatal-to-postnatal sequential strategy centered on minimally invasive surgery and combined with EXIT and ECMO achieves seamless critical CDH care, significantly improving survival while reducing trauma and recurrence. Early ECMO initiation may further improve outcomes; its indications and timing require standardization.

[10-108]**Congenital Diaphragmatic Hernia in multifetal pregnancies: a comparison of perinatal outcomes with singleton pregnancies****Federica Bellussi**

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Objective: The aim of our study was to compare perinatal mortality among fetuses with congenital diaphragmatic hernia (CDH) in multifetal versus singleton pregnancies.

Methods: We performed a retrospective review of all fetuses with CDH evaluated at our center between 2015 and 2025. Fetuses with associated anomalies, triplet pregnancies, those who underwent fetal endotracheal occlusion, and those who did not deliver in our Special Delivery Unit were excluded. The primary outcome was perinatal mortality. Secondary outcomes included extracorporeal membrane oxygenation (ECMO) and preterm birth (PTB) before 34 weeks.

Results: 667 fetuses with CDH were identified during the study period. Among these, 242 fetuses had isolated CDH and met inclusion criteria, including 8 affected twins and 234 singletons. The rate of perinatal mortality was similar between the two groups (12.5% vs 9%, $p = 0.53$). Likewise, the rate of PTB < 34 weeks (12.5% vs 3.42%, $p = 0.2$) and the rate of ECMO (12.5% vs 23%, $p = 0.7$) did not differ significantly between the groups.

Conclusion: In this single-center cohort, twins with isolated CDH had similar perinatal mortality and neonatal outcomes compared with singletons with isolated CDH

[10-109]**Hospital Volume, Case Complexity, and Outcomes in Neonatal CDH: A National Analysis of the KID Database****April Angelica Carlson**

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Background: Regionalization of complex neonatal surgical care has been described, but contemporary patterns and associated outcomes remain unclear. Here we focus on congenital diaphragmatic hernia (CDH), aiming to evaluate temporal trends in regionalization and assess the influence of institutional surgical volume in children on outcomes.

Methods: This is a retrospective cross-sectional analysis using the Kids' Inpatient Database (2016, 2019, 2022) focusing on neonatal (age ≤ 28 days) hospitalizations. CDH diagnoses and repairs were identified using ICD-10-CM and ICD-10-PCS codes. Hospitals were stratified into low-, medium-, and high-volume groups based on weighted annual pediatric surgical volume. Temporal trends in case distribution were assessed, and outcomes were compared across volume groups using survey-weighted analyses.

Results: 1,512 neonatal CDH cases were identified. The proportion of cases managed at high-volume centers was similar across years (42.2% in 2016 vs 44.0% in 2022, $p=0.53$). High-volume centers managed a greater proportion of clinically complex patients and transfers. Adjusting for severity, post-operative mortality was similar across low- (12.2%), medium- (12.2%), and high-volume (10.9%) centers ($p=0.81$).

Conclusions: Regionalization of CDH care persists, with higher-volume centers managing higher complexity patients. Despite differences in case mix, in-hospital mortality was similar across volume groups, including high-risk patients.

[10-110]

Third-Trimester MRI O/E Total Lung Volume Predicts 2-Year Cognitive Outcomes in Isolated Congenital Diaphragmatic Hernia

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Background: Prenatal imaging metrics predict survival in congenital diaphragmatic hernia (CDH), but their association with long-term neurodevelopment remains unclear.

Methods: Single-center retrospective cohort study of isolated CDH patients treated from 2009–2023. Patients with Bayley-III assessment at 2-year follow-up were included (n=71). Those with bilateral CDH, multiple gestation, chromosomal abnormalities, or major congenital anomalies were excluded (n=7). Univariate and multivariable regression analyses evaluated associations between prenatal imaging variables and continuous Bayley language, motor, and cognitive composite scores.

Results: Greater initial O/E LHR (n=39, p=0.044), early MRI O/E TLV (n=48, p=0.039) third trimester MRI O/E TLV (n=50, p=0.014), and higher gestational age (GA) at birth (p=0.014) were associated with higher cognitive composite scores. No prenatal imaging variable was significantly associated with language or motor composite scores, however, higher GA at birth was associated with greater language (p=0.009) and motor (p=0.005) scores. In multivariable analysis, higher third trimester MRI O/E TLV was independently associated with higher cognitive composite score after adjustment for GA at birth (p=0.010) and further adjustment for length of hospital stay (p=0.005).

Conclusion: Third-trimester MRI O/E TLV is independently associated with 2-year cognitive outcomes in isolated CDH and may help identify children at risk for later cognitive impairment.